Catalyzing digital services

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By: Craig Nevill-Manning and Prem Ramaswami

TECHNOLOGY UPDATE FOR
Waterfront Toronto's
Digital Strategy Advisory Panel
FEBRUARY 14, 2019
SIDE WALK LABS

Ever go to push open a door, only to find that the way to open it is with a pull?

It's easy to think that you're making the mistake, but you're not. The mistake was made at the design stage, when the architect failed to build in the appropriate cues about whether to push or pull.

Now, imagine the same scenario — but this time, the building senses that many people push rather than pull, and shares this aggregate information with a design team, so they can fix the problem. That is the value of understanding, in real time, how people use public spaces.

Sidewalk Labs doesn't believe in creating technology or gathering data for its own sake, and one of our core principles in working on the Sidewalk Toronto project is that data should only be gathered when it can be used to improve the lives of residents, workers, visitors, or businesses. Today, cities around the world are using data to improve the lives of urban residents.

In Singapore, an app called Beeline uses data on aggregate commuter patterns to help private operators offer new bus routes. In Boston, a company called Biobot analyzes wastewater in sewers to identify public health risks far earlier than traditional methods can. In Louisville, the city government and a startup called Propeller collaborated to alert residents with asthma of air quality hazards.

In February, Waterfront Toronto's Digital Strategy Advisory Panel (DSAP) gave us an opportunity to discuss some of the work we have been exploring around data and digital services as part of the Master Innovation and Development Plan (MIDP), which will be released later this spring. In addition to discussing our approach to open standards, we explored two more examples of how technology will figure in our plans, as well as our digital accessibility principles. You can find our full presentation to DSAP here.

As we consult on a broader data governance policy for our project, we are committed to the responsible use of data, including "privacy by design" principles. The following is a summary of what we presented to the DSAP. It reflects our most current thinking, which we will continue to refine as we learn more.

Our approach to open standards

At Sidewalk Labs, we believe that urban data should only be collected consistent with publicly-accepted standards and treated as a public asset.

Openness is essential to providing new services that help improve quality of life and drive urban innovation by third parties. Just as no single company owns the web, no single company, organization, or agency should own the urban data or databases used to improve cities. They must be publicly accessible to be improved.

Sidewalk Labs has a three-part plan to achieve the goal of a neighbourhood with open digital infrastructure. First, we propose to provide data in standard formats, and via well-defined, public application programming interfaces (open architecture). Where relevant standards do not exist, we will work with other companies, researchers and standards bodies to create those standards. Second, we propose to make this data publicly accessible by default (open access). Third, we propose that the software source code required for others to integrate with any system we help put in place be made publicly available under a free software license (open source).

Enabling a safe, vibrant mix of building uses

Cities have traditionally been separated into residential, commercial and industrial uses to protect homes from noise, air pollution and other nuisances. This discourages an active mix of home, work and retail in the same neighbourhood. The lack of mixed use results in areas of a city that are deserted at certain hours, making it difficult for businesses, increasing travel for workers, and sometimes creating deserted city blocks.

Sidewalk Labs proposes to create a real-time building code system built around the idea that buildings should be able to house a wide range of tenants — residential, commercial, and light industrial alike — so long as businesses follow agreed-upon rules around conditions such as noise, air pollution, and nuisances. For example, as long as a family-run craft jeweler does not use noxious chemicals or make loud noises, there is no reason to force it to locate in an industrial area.

This outcome-based system will monitor several types of commercial building regulations on an ongoing, real-time basis via environmental sensors in common spaces (such as hallways and lobbies). These devices will collect non-personal information on a building's structural integrity and vibrations, interior air quality, noise levels, and energy and water use relevant to commercial spaces. This system will be designed to collect only the specific data pertaining to commercial building codes and access to data will be restricted and monitored and only related to commercial tenants. Commercial tenants would be notified, first, if they are engaged in low-level violations of the rules; notification of building management would come next if not addressed.

We think that outcome-based building codes will enable a more vibrant, mixed-use community where residents, workers and businesses can thrive together.

Improving mobility

Cameras with on-device de-identification can be among the most versatile, privacy-preserving, and cost-effective options for measuring how easily local populations can move from point A to point B. If we can measure real-time flows of pedestrians, bicycles, and vehicles, we can develop a mobility system that is more adaptable to changing needs — and then use that understanding to implement changes to reduce congestion and improve safety.

To test some of these concepts and ideas, we are piloting technology developed by Numina at our headquarters at 307 Lake Shore Boulevard East, to examine how people interact with our new outdoor comfort prototypes.

Numina's software automatically detects an object within the sensor's field of view and classifies it into one of several broad categories: pedestrian, bicycle, car, bus, truck — capturing time stamped location data without tracking any personal information. All of the data captured by Numina is de-identified at source with the exception of one low-resolution blurred image per hour that is stored for 30 days to support quality assurance purposes.

We will use the Numina technology to better understand the flow of people throughout the space at 307 and aggregate statistics about time spent looking at exhibits, including our outdoor weather mitigation structures, flexible pavers, and indoor exhibits.

Our approach to accessibility

Quayside provides us with the opportunity to incorporate accessibility from the start of the design and development process. Over the last year, we engaged Toronto's active and expert accessibility community and held a number of co-design sessions. We believe that it is critical to involve this community into the design process at the very beginning and we will stay engaged with them throughout the process.

Through this collaboration, we are developing a core set of principles grouped into three main areas — General Accessibility, Physical Accessibility and Digital Accessibility — that will guide our work and keep us on track as we plan Quayside.

We wrote about our engagement process, these draft accessibility principles, and how to provide feedback in our last blogpost, which you can read here.

With Quayside still in the planning stages, we are using this time to test and refine these ideas. We look forward to ongoing input from Waterfront Toronto's Digital Strategy Advisory Panel and others. The opportunity to use data to create spaces that are more accessible and responsive to the people who use them is exciting. We're committed to working with everyone to get it right.

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Sidewalk Toronto project update

By: Dan Doctoroff, CEO of Sidewalk Labs

We came to Toronto because we want to build great things and innovate in ways that improve urban life — and this is the only city in the world that has the mix of talent and tenacity to make this happen.

You've been hearing about our plans and vision for well over a year now. We've led and participated in lots of great conversations with Torontonians — more than 18,000 so far — that have helped shape and refine a shared vision for the waterfront.

Recently, some of what we've been working on…

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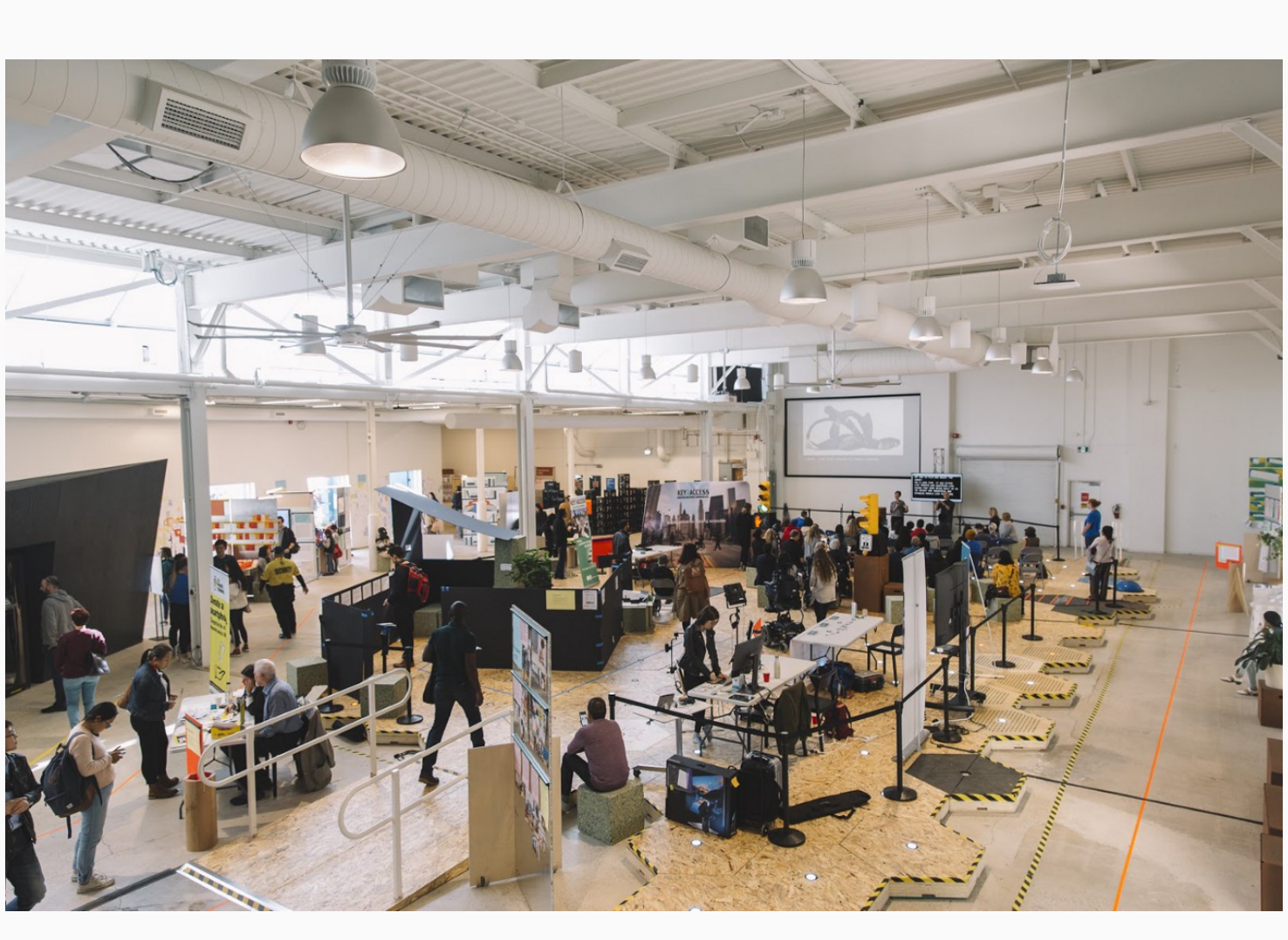

A top-down view of Sidewalk Labs' Toronto HQ 307, with a cluster of people listening to a talk and several accessible tech installations. Toronto residents visited 307 for our third Open Sidewalk event in the fall of 2018 and explored projects and experiments that focused on allowing for accessibility and dynamic flexibility in the urban environment. (Image: Jenna Wakani)

CO-DESIGNING A MORE ACCESSIBLE COMMUNITY

By Samara Trilling, Software Engineer and Accessibility Lead, Sidewalk Labs

I'm a software engineer. That means I spend my days thinking about problems, how to break them down into smaller problems, and then how to solve them.

It is an iterative process. Sometimes, engineers learn more from what we get wrong than what we get right. What keeps us focused is the end user — the person who benefits from all our work. Working with them as co-equal participants in the design process, we try to understand their problems, then determine how our solution is helping (or, sometimes, not helping)…

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CREATING A PATHWAY TO CLIMATE POSITIVE COMMUNITIES

By Charlotte Matthews, Director of Sustainability, Sidewalk Labs

I love buildings. When I was eight years old my family moved to Hong Kong, one of the world's most amazing cities. But even as I grew up fascinated by architecture, I also saw, in vivid detail, the heavy impact human activity had on the world around us.

So, I also care deeply about protecting the environment. The environment can't speak for itself. It needs us to speak — and act — on its behalf.

How the built and natural environments can intersect for the benefit of both — and ultimately, for…

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BUILDING THE BACKBONE OF CONNECTIVITY

Craig Nevill-Manning and Prem Ramaswami, Sidewalk Labs

Building a new neighborhood from scratch is an opportunity to think about how digital infrastructure can be improved to be cheaper, better, and easier to change as technology evolves.

Digital infrastructure is a basic building block of cities today and tomorrow — the backbone of connectivity that will help residents, companies, organizations, and local agencies use data to launch new services that improve our everyday lives.

Digital infrastructure is what alerts a traffic light that a streetcar is running behind schedule and should get a green light. Digital infrastructure is what tells people…

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Public life study volunteers from the Thorncliffe Park Women's Committee at R.V. Burgess Park

CommonSpace: A NEW DIGITAL TOOL FOR PUBLIC LIFE STUDIES

Jacqueline Lu and Matt Breuer, Sidewalk Labs

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Public spaces are vitally important to our cities. They are where we all come together, where we build our community and are essential to the social fabric of our neighbourhoods. Which is why as communities grow and needs change over time, we need to understand how our streets, plazas, and parks are being used and how we can make them better.

One way of doing this is through ***public life studies***, a set of observational methods for measuring how people use public spaces. People have been gathering this kind of information…

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